Dayside Auroras Caused by Interplanetary Shocks: Coordinated Observations

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Interplanetary shocks transfer energy directly into the magnetosphere. Taken from POLAR UV imaging data, this energy is ~ 4 times that of substorms. These have been two types of energy transfer mechanisms proposed in the literature: 1) betatron acceleration of preexisting plasma followed by a loss cone instability, growth of plasma waves and scattering of particles into the loss cone; 2) creation of near ionospheric potential drops and direct particle energization. FAST particles, plasma waves and magnetic fields will be used to determine the relative effectiveness of these two mechanisms. DMSP high resolution particle spectra will be used to cover different altitude for the same event.